

**EPA comments to the Draft Baseline Human Health Risk Assessment Work Plan
Columbia Falls Aluminum Company NPL Site
Columbia Falls, Montana**

**Responses Prepared for Columbia Falls Aluminum Company, LLC by Roux / EHS Support, LLC
Dated February 13, 2018**

Specific Comments - USEPA Comments in Black. Roux / EHS Support LLC responses in blue.
EPA second response in red.

- 1) Section 1.0 (Page 1) – Please add “Superfund” when first mentioning the Site name.

The BHHRA Work Plan (WP) will be revised as requested.

EPA Response: Please revise the first mention to be similar to that presented in the Draft Baseline Ecological Risk Assessment Work Plan, “the former CFAC aluminum reduction facility (commonly referred to as an aluminum smelter) Superfund Site located in Flathead County, Montana (Site).”

- 2) Section 2.4.1 (Page 8) – Further evaluation in the HHRA is needed to support conclusions regarding fluoride concentrations in Aluminum City and their comparability to background. Provide additional information on the fluoride concentrations observed in background samples, the number of background samples available for consideration, and a statistical comparison of the two datasets (site vs. background).

The background data set consists of 117 public water supply (PWS) wells that reported fluoride concentrations to MDEQ from 2013 to 2016. MDEQ has indicated in their e-mail correspondence on February 5, 2018, that “None of the public water systems in Flathead County are adding fluoride to their water supplies so all of the detected amounts are naturally occurring fluoride. As you can see in the results we have one area in Flathead County where naturally occurring fluoride is greater than 1.0 mg/L, and that is west of Kalispell in the Smith Valley/Kila area.” A two-sample t-test was performed to compare the means of groundwater fluoride concentrations collected from PWS wells in Flathead County to groundwater fluoride concentrations measured in Aluminum City wells, utilizing ProUCL (version 5.0). When performing the comparison, the background wells exhibiting elevated concentrations of fluoride (i.e., greater than 1.0 mg/L) were treated as outliers and excluded from the dataset. The results of the comparison indicate that mean concentration beneath Aluminum City is less than the mean concentration in Flathead County PWS wells. The text of HHRA WP will be revised to incorporate this discussion and analysis; the data and ProUCL output will be included in an Appendix to the BHHRA WP.

EPA Response: The identification of outliers appears to be arbitrary, a formal outlier test should be performed. It is unclear how a cutoff of 1.0 mg/L determined and how many outliers were removed. This information should be included. It is also suggested that a scatter plot of the data be added to demonstrate the variability and identify the outliers.

Roux/EHS Response: The above referenced statistical analysis, including a formal outlier test, was performed for the PWS and Aluminum City datasets. A full description of the analysis, including the data, outlier tests performed and outliers removed, graphs generated, and ProUCL outputs is

provided as Appendix A to this response. The results of the analysis indicate the mean fluoride concentration beneath Aluminum City is less than the mean concentration in Flathead County PWS wells. The text of HHRA WP will be revised to reference and summarize the statistical analysis; the Appendix A attached to this response will be included as an Appendix to the BHHRA WP.

EPA Response: In order to evaluate potential groundwater impacts resulting from the Site in Aluminum City wells, it would be more appropriate to evaluate individual wells (where data are sufficient) in Aluminum City that are nearest the Site as compared to public water supply wells in the county. By including all wells from Aluminum City as a group, the comparison may be influenced by the number of samples for each well in addition to the location of each well relative to the Site.

In reviewing Appendix A, it appears that the summary statistics provided on page 1 are incorrect for Aluminum City and require correction. At a minimum, the maximum concentration should be 0.28 and the number of observations should be higher than 17. Please review all summary statistics on page 1 and correct as needed.

- 3) Section 2.4.3 (Page 9) – Expand the conclusion that “*there is no potential for exposure to asbestos by human receptor activity in the Asbestos Landfills*” to state under what conditions this is true. Because only surficial soils were sampled, characterization of subsurface soils is lacking. If subsurface soils are disturbed, there is potential for asbestos exposure. In addition, it needs to be noted that asbestos-containing building material have a tendency to rise from the subsurface and become exposed.

The BHHRA WP will be revised to expand on the conclusion as requested.

EPA Response: Text should be revised to that the “there is no potential for exposure to asbestos in surficial soil by human receptor activity in the Asbestos Landfills under current conditions.”

- 4) Section 2.5 (Page 10) – The workplan would benefit from having a figure/flow diagram depicting the conceptual site model.

The Work Plan will be revised to include a figure that presents the potentially complete exposure pathways including media, receptor, and exposure route presented in the Conceptual Site Model (CSM).

EPA Response: According to Figure 4 and Figure 5, there are no complete current exposure pathways for the construction worker. With the demolition activities that have been ongoing at the Site, would appear to be incorrect. Please clarify why no pathways are currently complete for the construction worker or correct these figures as appropriate. For the trespasser, ingestion/dermal contact with sediment are current complete pathways, but not in the future. Please clarify why this is the case or correct these figures as appropriate.

- 5) 3.1.1.2 (Page 20) – The workplan must provide a discussion of data quality, beyond completeness and rejected data. This discussion should include information on sample representativeness, method comparability, result accuracy and precision, sample variability, and analytic sensitivity.

The BHHRA WP will be revised to provide this discussion.

EPA Response: It appears that the Phase II Site Characterization SAP was referenced in response to this comment. The comment was referring to the lack of discussion for the inclusion of the evaluation of this information in the risk assessment. Revise the text as appropriate to state that these items require discussion in the risk assessment.

- 6) Section 3.1.1.3 (Page 21) – Please provide a citation for the USEPA RSL version that was used in the chemical of potential concern (COPC) selection.

The BHHRA Work Plan will be revised to include the citation for the USEPA RSLs used in the selection of COPCs.

EPA Response: A citation was added for USEPA 2017a, “USEPA. 2017a. Regional Screening Levels for Chemical Contaminants at Superfund Sites and User's Guide. DOE Oak Ridge National Laboratory (ORNL)”. It is unclear what this is referring to. The most recent version of USEPA’s RSL tables should be used (May 2018), with a citation referring to the website where these values are presented.

- 7) Section 3.1.1.3 (Page 22) – Revise the workplan to identify the basis of toxicity values, in cases where the selected values are not directly used as presented in the USEPA RSL table. See below for example text that should be included for chromium for additional information:

Chromium: Although measured chromium concentrations in environmental media were based on total chromium, for the purposes of COPC selection, maximum concentrations will be compared to RSLs based on hexavalent chromium [Cr(VI)], which is the more toxic form. The RSL table identifies screening levels for oral exposure to soil or water based on the assumption that Cr(VI) is carcinogenic by the oral route. However, EPA’s Integrated Risk Information System (IRIS) database states “No data were located in the available literature that suggested that Cr(VI) is carcinogenic by the oral route of exposure.” For this reason, the screening levels for Cr(VI) in soil and water will be set equal to the non-cancer RSLs.

The BHHRA Work Plan will be revised to expand and clarify the basis of toxicity values and their use in the USEPA RSL table versus their use in the selection of COPC process.

EPA Response: Since the time of providing the initial comment, a refined understanding of chromium toxicity is being employed at EPA Region 8 sites. In particular, to be consistent with the OSWER directive on the toxicity value hierarchy for chromium (EPA 2003), the HHRA should evaluate oral carcinogenicity for Cr(VI) using the oral slope factor identified by the California Environmental Protection Agency (CalEPA). Therefore, carcinogenicity of chromium should be considered at all stages (COPC selection, toxicity assessment, and risk characterization) in the HHRA.

- 8) Section 3.1.1.3.1 (Page 22) – It is recommended the workplan consider the future changes to the lead criterion. The November 2017 version of the USEPA RSL table presents a value of 400 milligrams per kilogram (mg/kg) as the residential lead soil screening value, however, this value is based on a target blood lead level of 10 micrograms per deciliter (µg/dL) and does not reflect recent changes in USEPA guidance on lead modeling (e.g., USEPA 2017a,b). USEPA Region 8 recommends the following when performing lead risk assessments: evaluate risks for a range of target blood lead levels (i.e., 5, 8, and 10 µg/dL), employ modified ingestion rates (von Lindern et al. 2016), revise the child age range to

be 12-72 months (USEPA 2017b), revise the maternal blood lead to 0.8 µg/dL (USEPA 2017a), and change the default water concentration to 0.8 µg/L. It is recognized that the current version of the USEPA RSLs (November 2017) do not reflect these changes. However, these changes in approach were recently approved by the USEPA Technical Review Workgroup (TRW) during the lead consultation for another Region 8 Superfund site (Eagle Mine). Evaluation of risks due to lead will be revisited at the time of the 5-year review for the Site; however, inclusion of these changes now may limit potential future re-work as part of the 5-year review. This is a global comment to be considered for all receptors.

As discussed at the meeting and shown on Figure 1 attached to these response to comments, the Phase I results indicate lead is not an important COPC at the Site. Soil samples will continue to be analyzed for lead during the Phase II Site Characterization. The BHHRA WP will be revised to note that the lead screening level used for the preliminary screening is being considered for revision, and that final screening of COPCs after completion of the Phase II Site Characterization will use EPA RSLs and MDEQ guidance that are in effect at that time.

EPA Response: There are areas of the Site that have not been adequately characterized at this time. It is premature to draw the conclusions that lead is not an important COPC at the Site.

Roux/EHS Response: The EPA response is noted and the Work Plan will not state that lead is not an important COPC at the Site.

EPA Response: The BHHRA WP should include use of MDEQ screening value of 153 mg/kg (MDEQ 2017) based on 5 µg/dL, while noting that it is EPA Region 8's preference to evaluate risk based on 5 µg/dL, 8 µg/dL, and 10 µg/dL with revisions intake rates, age of exposure, etc. included in the original comment.

- 9) Section 3.1.2.1 (Page 36) –There appears to be confusion regarding variability and uncertainty. In risk assessment, the central tendency exposure (CTE) and reasonable maximum exposure (RME) are intended to represent the range of *variability* within the population of interest, whereas use of the 95% upper confidence limit (95UCL) on the mean is intended to address *uncertainty* in the exposure point concentration (EPC). RME exposure parameters represent reasonable maximums, such that exposure parameters are adequately conservative for high-end exposures. However, uncertainty in the mean applies to both the CTE and RME scenarios (USEPA 1992; 2001); per USEPA guidance, the 95UCL should be employed as the EPC for both (see Section 1.2.4 of USEPA [2001] for an explicit statement in this regard). Please revise this discussion as appropriate.

The BHHRA Work Plan will be revised to clarify the variability and uncertainty relative to the CTE and RME exposure scenarios, and the use of the 95 percent UCL statistic.

EPA Response: There still appears to be confusion regarding the use of the RME and CTE terminology in conjunction with EPCs. RME and CTE terminology should be used in conjunction with exposure parameters, meaning that a central tendency and reasonable maximum exposure duration, exposure frequency, ingestion rate, etc. should be evaluated in the risk assessment with the EPC being based on the best estimate of the mean (i.e. the 95th UCL on the mean) to be conservative. The language in the first and second paragraph in this section require revision.

- 10) Section 3.1.2.2 (Page 37) – Rather than reference the “USEPA RSL exposure equations”, please include the dose-based equations that will be used to calculate daily intake rates for the various exposure routes that are complete at the Site.

The RI/FS Work Plan did not require the completion of the RAGS Part D table 4 series as part of the BHHRA WP. The exposure assumptions and intake models/equations for this exposure scenario will be included in the Table 4 series for BHHRA; the completed Table 4s will be submitted as interim deliverables. The interim deliverable will include a cover memo describing the overall approach and details on the methodology; the Work Plan will be revised to note the submittal of these tables as interim deliverables.

EPA Response: The comment is not requesting that calculations actually be performed, rather that the standard dose-based equations be presented in the workplan. See below for an example:

The amount of chemical which is ingested by receptors exposed to Site media may be quantified using the following general equation.

$$DI = C \cdot (IR / BW) \cdot (EF \cdot ED / AT) \cdot RBA$$

- 11) Section 3.1.2.2 (Page 37) – Please include information regarding the age range for receptors at the Site and the approach for time-weighting the exposure of receptors based on their lifetime exposure risks, as recommended in USEPA guidance (USEPA 1989).

The RI/FS Work Plan did not require the completion of the RAGS Part D table 4s as part of the BHHRA WP. The exposure assumptions and intake models/equations for this exposure scenario will be included in the Table 4 series for BHHRA; the completed Table 4 series will be submitted as interim deliverables. The interim deliverable will include a cover memo describing the overall approach and details on the methodology; and, the Work Plan will be revised to note the submittal of these tables as interim deliverables.

EPA Response: The comment is not requesting that calculations actually be performed, rather that the standard dose-based equations be presented in the workplan. See below for an example:

The amount of chemical which is ingested by receptors exposed to Site media may be quantified using the following general equation.

$$WA - DI = C \times \left[\frac{IR_c \times EF_c \times ED_c}{BW_c \times (AT_c + AT_a)} + \frac{IR_a \times EF_a \times ED_a}{BW_a \times (AT_c + AT_a)} \right]$$

- 12) Section 3.1.3 (Page 38) – Please include information on the sub-chronic exposure scenarios, if any, that will be evaluated and provide an explanation for how this evaluation will differ from the chronic exposure evaluation.

The RI/FS Work Plan did not require the completion of the RAGS Part D table 4s as part of the BHHRA WP. The exposure assumptions and intake models/equations for this exposure scenario will be included in the Table 4 series for BHHRA; the completed Table 4 series will be submitted as interim deliverables. The interim deliverable will include a cover memo describing the overall approach and

details on the methodology; and, the Work Plan will be revised to note the submittal of these tables as interim deliverables.

EPA Response: It is unclear how the response provided is responsive to the comment.

References submitted with comments

MDEQ. 2017. Memorandum: Screening Levels for Lead in Soil. From: Aimee Reynolds. April 9, 2017.